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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	
Peter Frisk et al.	Group Art Unit: 1772
Application No.: 09/890,155	Examiner: Patterson, Marc A.
Filed: November 9, 2001	Appeal No.:
For: LAMINATED PACKAGING MATERIAL FOR PAPER CONTAINER	

APPEAL BRIEF TRANSMITTAL LETTER

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Examiner dated March 16, 2004, finally rejecting Claims 1-6 of the above-identified application. Attached is the Appeal Brief.

☐ A check covering the ☐ $165.00 (2402) ☐ $330.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

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The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in triplicate.

Respectfully submitted,

Burns, Doane, Swecker & Mathis, L.L.P.

Date September 16, 2004

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In re Patent Application of	
Peter Frisk et al.	Group Art Unit: 1772
Application No.: 09/890,155	Examiner: Marc A Patterson
Filed: November 9, 2001	Confirmation No.: 7579
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APPEAL BRIEF

TABLE OF CONTENTS

I. Real Party in Interest

The real party in interest with respect to this application is Tetra Laval Holdings & Finance S.A., the assignee of record in this application by virtue of the Assignment submitted on November 9, 2001.

II. Related Appeals and Interferences

There are no other prior and pending appeals, interferences or judicial proceedings known to the Appellant, the Appellant's legal representative, or the assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

III. Status of Claims

The claims currently pending in this application are Claims 1-6, all of which stand finally rejected. Claims 1-6 are being appealed.

IV. Status of Amendments

An Amendment was filed on June 16, 2004 after issuance of the final rejection. That Amendment has not been entered and so the new claims presented in that Amendment are not at issue in this appeal.

V. Summary of Claimed Subject Matter

The claims on appeal are generally directed to a packaging material for making paper containers. As discussed in the background portion of the application beginning at line 20 on page 1, packaging containers for liquid food products can be manufactured in several ways. One way involves forming the packaging material into a tubular shape by providing a longitudinal seal along the packaging material, packaging or filling the liquid food product into the tubular shaped package, transversely sealing the tubular shaped packaging material below the liquid food product, cutting the tubular shaped packaging material at fixed intervals, and then performing folding at crease lines to finish forming the container. Another way involves cutting the paper packaging material to a predetermined shape, sealing together lengthwise edges of the packaging material, sealing the bottom of the packaging material to form an open top container, packaging or filling the liquid food product into the bottom sealed container, and then sealing the upper part of the container to finish forming container.

The discussion beginning at line 15 on page 2 of the application points out that packaging laminates have been produced in the past using low density polyethylene (LDPE). With these types of materials, it has been found that the low molecule component of the LDPE has a tendency to bleed into the food content in the container. If the container with the liquid food product is stored for a relatively long period of time, it is possible that the taste of the food product might be adversely affected.

The background portion of the application also points out in the discussion beginning at line 14 on page 3 that LDPE has also been used in connection with strip

tapes that are sometimes used between the two edges of the packaging material that are to be joined to form the container. In addition, the top wall of the container is sometimes provided with a punched hole to form a pouring opening which facilitates use of a pour spout or pull tab. A strip tape is once again used in these situations to cover the punched hole in the top wall of the container. At least some known strip tapes utilize LDPE either as a single layer composition or a multi-layer composition in which the LDPE is laminated to opposite sides of an intermediate layer.

The background portion of the application goes on to note, beginning at line 8 of page 3, that the packaging material for containers containing liquid food products should preferably possess certain barrier properties to avoid the loss of nutrients from the food product (e.g., vitamin C), inhibit oxygen from permeating through the container, and otherwise maintain the quality of the food product. Aluminum foil has been used in the past as a barrier material. However, as mentioned at the bottom of page 3 of the application, packaging materials using other barrier materials have been proposed. However, with at least some of these other barrier materials, it has been found that the surface portion of the packaging material that is to be sealed is polluted with an oxide resulting from the extrusion lamination step. Further, the surface of the packaging material may become polluted with the liquid food product introduced into the container. This is particularly so in the case of containers manufactured by forming the packaging material into a tubular shape that is subsequently transversely sealed because the sealing occurs below the liquid food product as mentioned in lines 24-26 on page 4 of the application. The ability to obtain a desirable or optimal seal in the packaging material can thus be adversely impacted.

Further, as discussed beginning in line 27 on page 4 of the application, depending on the nature of the liquid food product, the temperature conditions under which the liquid food product is introduced into the container during filling can vary quite broadly. At least some adhesive resins used in known packaging materials do not possess adequate sealing properties over a wide temperature range and so depending on, for example, the temperature of the food product introduced into the container or the sealing temperature, the quality of the seal can be negatively influenced.

A further point noted in the background portion of the application beginning in the last line of page 4 is that with some thermoplastic polymer materials used in connection with container packaging materials, the thermoplastic material layer may melt, or blisters/pinholes may form in some layers. This can adversely impact the seal strength and cause leakage of the liquid product.

In light of the foregoing, and as generally summarized in the discussions beginning at line 8 on page 5 of the application and at the top of page 27 of the application, with the packaging material here, relatively quick heat-sealing, tougher seal strength and reliable seals can be achieved over a wider temperature range for sealing. The packaging material is designed to provide a reliable seal that is not as susceptible to influence from the temperature of the liquid food product. The packaging material also does not adversely affect the quality of the liquid food product in the container in the same way as other known packaging materials.

The container packaging material at issue here is a multi-layer material. As discussed in more detail below, various aspects of the invention involve providing a packaging material in which specified layers of the packaging material contain at

least linear low density polyethylene (LLDPE) possessing certain characteristics, thus allowing realization of various benefits such as those mentioned above.

A. Independent Claim 1

As illustrated in Fig. 1 and described beginning in line 32 on page 17 of the application, the packaging material at issue here comprises a plurality of layers, including an outermost thermoplastic layer 21, a paper substrate layer 22, an adhesive layer 23, a barrier layer 24, another adhesive layer 25 and an innermost thermoplastic layer 26. The thermoplastic innermost layer is located closer to the interior or the container than the outermost layer when the packaging material is formed into the paper container. As discussed at several places in the application (see, for example, the discussion beginning in line 22 on page 5 of the application and the discussion beginning in line 6 on page 12 of the application), the thermoplastic material innermost layer contains at least linear low density polyethylene having a narrow molecular weight distribution, and possesses an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103 °C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-50-micrometer.

B. Dependent Claim 2

The application also describes characteristics associated with the thermoplastic material outermost layer (see the discussion beginning at line 1 of page 6 of the application and the discussion beginning at line 6 of page 10). The thermoplastic material outermost layer contains at least a linear low density

polyethylene which has a molecular weight distribution, and has an average density of 0.900 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer.*

C. Dependent Claim 3

The paper container packaging material also includes a particular adhesive layer between the barrier layer and the thermoplastic material innermost layer. The application describes beginning at line 7 of page 6 and beginning at line 27 of page 8 that the adhesives layer between the barrier layer and the innermost layer contains at least a linear low density polyethylene having a molecular weight distribution, an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 2-15 micrometer.

D. Dependent Claim 4

The paper container packaging material described in the application also includes a particular adhesive layer between the paper substrate layer and the barrier layer. As discussed at various places in the application (see, for example, the discussion beginning at line 14 of page 6 and the discussion beginning at line 8 of

* The undersigned would like to bring to the Board's attention a typographical error that occurred during prosecution of this application before Examiner Patterson. As originally filed, Claim 2 recited that the outermost layer possesses a thickness of 10-25 micrometers. While preparing the Claims Appendix for this Appeal Brief, the undersigned noticed that in the Preliminary Amendment filed with the application, this thickness recitation in Claim 2 was inadvertently written as 10-15 micrometers. It was not intended that this thickness recitation in Claim 2 be changed from 10-25 micrometers to 10-15 micrometers. Thus, the claims presented in the Claims Appendix set forth the correct 10-25 micrometer thickness recitation. If it is necessary to correct this inadvertent error through submission of a formal paper, the undersigned will do so at the conclusion of this appeal.

page 9) that the adhesive thermoplastic material layer between the paper substrate layer and the barrier layer contains at least a linear low density polyethylene having a molecular weight distribution and possessing an average density of 0.890 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 10 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer.

E. Independent Claim 5

The application also describes that another aspect of the invention involves a paper packaging container formed from a packaging material. As discussed at various places in the application (see, for example, the discussions beginning at line 22 of page 6 and line 6 of page 12), and as shown in Fig. 1, the packaging material forming the container comprises at least a thermoplastic material outermost layer 21, a paper substrate layer 22, a barrier layer 24, and a thermoplastic material innermost layer 26 in that order, with the innermost layer being located closer to the interior of the packaging container than the outermost layer. The thermoplastic material innermost layer contains at least a linear low density polyethylene having a molecular weight distribution and possessing an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-50 micrometer. As shown in Fig. 3 and described beginning at line 8 of page 8 of the application, the packaging material container also includes a strip tape 27 covering a discontinuous section of the thermoplastic material innermost layer 26 between two edges of the packaging material in a liquid tight manner. Figs. 4 and 5, and the

associated description at page 8, lines 19-26, note other alternatives for the strip tape 28 covering a discontinuous section of the thermoplastic material innermost layer 26. The application points out in the discussion beginning at line 32 of page 6 that at least the sealing-surface layer of the strip tape 27, 28 contains a linear low density polyethylene having a molecular weight distribution, an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-100 micrometer.

F. Independent Claim 6

A further aspect of the invention discussed beginning at line 5 of page 7 and line 21 of page 12 involves a paper packaging container formed from a packaging material that comprises at least an outside thermoplastic material layer, a paper substrate layer, and an inside thermoplastic material layer in that order. The inside thermoplastic material layer contains at least a linear low density polyethylene and has an average density of 0.910 g/mL - 0.930 g/mL, a peak melting point of 115 degrees°C or more by differential scanning calorimetry, a melt flow index of 5 dg/min - 15 dg/min, and a swelling ratio of 1.45-1.55.

VI. Grounds of Rejection to be Reviewed

A. Claims 1-4 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,418,841 to *Eckstein* in view of U.S. Patent No. 5,536,542 to *Gillespie et al.*

B. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,418,841 to *Eckstein* in view of U.S. Patent No. 5,536,542 to *Gillespie et al*, and further in view of U.S. Patent No. 5,732,825 to *Ikenoya et al.*

VII. Argument

A. Claims 1-4 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,418,841 to *Eckstein* in view of U.S. Patent No. 5,536,542 to *Gillespie et al.*

1. Independent Claim 1

Independent Claim 1 recites a packaging material comprising at least a thermoplastic material outermost layer, a paper substrate layer, a barrier layer, and a thermoplastic innermost layer. The thermoplastic innermost layer contains at least a linear low density polyethylene having a molecular weight distribution, an average density of 0.900 g/ml - 0.915 g/ml, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4 -1.6, and a layer thickness of 20-50 micrometers.

Eckstein discloses a multiple layer polymeric-based sheet structure having a plurality of layers including layers 12, 14, 18, 32 made of linear low density polyethylene (LDPE), a paper layer 16, an aluminum foil layer 28, several EAA layers 26, 30, an OPP layer 22, and several PEI layers 20, 24. *Eckstein* notes at lines 21-27 of column 5 that the LDPE layer 32 can be composed of LLDPE rather than LDPE. The Examiner correctly notes that *Eckstein* lacks any disclosure that the LLDPE layer 32 possesses an average density of 0.900 g/ml - 0.915 g/ml, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, and a swelling ratio of 1.4 -1.6.

To address the foregoing deficiencies, the Examiner turns to the disclosure in *Gillespie et al.* This document describes a method of sealing two

opposing extrusion coated polyethylene laminate surfaces to weld the surfaces and effect a heat seal. The disclosure in this document is specifically concerned with providing a material that will permit low temperature heat sealing. *Gillespie et al* describes using a low density polyethylene (LDPE) having a melt index of 1 dg/min - 4 dg/min at 190°C, an annealed density of 0.92 g/cc - 0.93 g/cc, a melting point of 106.9°C, and a swell ratio of 1.2 - 1.3. The Examiner contends that *Gillespie et al* "teaches" the use of a polyethylene having certain claimed parameters for melt index, average density, peak melting point and swell ratio, and that it would have been obvious to use a polyethylene material having such parameters in the sheet structure described in *Eckstein*.

As a starting point, it is significant to note that the polyethylene material mentioned in *Gillespie et al* which possesses the disclosed values for melt index, annealed density, melting point and swell ratio is a **low density polyethylene** (LDPE). This is to be contrasted with the subject matter recited in independent Claim 1 defining that the thermoplastic material innermost layer contains at least a **linear low density polyethylene** (LLDPE). These are different materials, the former having a branched chain structure and the latter having a linear chain structure.

It is recognized that *Eckstein* mentions that the inner layer 32 can be made of linear low density polyethylene (LLDPE). However, the Examiner relies upon the disclosure in *Gillespie et al* as setting forth a certain "teaching" and this "teaching" must be considered as a whole and in its entirety. *In Re Fine*, 783 F.2d 1038, 1041, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir 1986)(noting it is impermissible to pick and choose only portions of a prior art disclosure necessary to support a rejection, while disregarding other portions that provide a full appreciation of the disclosed subject

matter). In this regard, what *Gillespie et al.* actually discloses is utilizing a **low density polyethylene** (LDPE) layer having the disclosed values for melt index, peak melting point, annealed density and swelling ratio. Nowhere does *Gillespie et al* state that the disclosed values for melt index, peak melting point, annealed density and swelling ratio should be used, independent of the type of material. More to the point, the disclosure in *Gillespie et al* in no way suggests that one should use a linear low density polyethylene (LLDPE) having the disclosed values for melt index, peak melting point, annealed density and swelling ratio. Rather, *Gillespie et al* is clear in noting the use of a low density polyethylene (LDPE) layer possessing the disclosed characteristics. Thus, if one were somehow motivated to employ *Gillespie et al*'s polyethylene material having the disclosed values for melt index, peak melting point, annealed density and swelling ratio, one would utilize low density polyethylene (LDPE) because that is what *Gillespie et al.* discloses. Thus, applying the disclosure in *Gillespie et al.* to the sheet structure disclosed in *Eckstein* would not have resulted in the subject matter recited in the independent Claim 1.

In addition, *Gillespie et al* fails to disclose the values recited in Claim 1 for melt flow index, average density and swelling ratio. Claim 1 recites that the low density polyethylene has a melt flow index of 5 dg/min - 20 dg/min, an average density of 0.900 g/mL - 0.915 g/mL, and a swelling ratio of 1.4-1.6. In contrast, *Gillespie et al* describes a melt index of 1 dg/min – 4 dg/min, an annealed density of 0.92 g/cc – 0.93 g/cc, and a swell ratio of 1.2 – 1.3. In fact, *Gillespie et al* goes on to emphasize that one should not utilize a polyethylene material having values for melt index, annealed density and swelling ratio that are outside the disclosed values.

For example, *Gillespie et al* explicitly states in column 3, lines 16-19 that polyethylene with a density much below 0.92 g/cc tends to exhibit high coefficients of friction which causes processing problems during carton converting operations. Thus, *Gillespie et al* specifically states that one should not use an annealed polyethylene having an average density as recited in Claim 1.

Similarly, *Gillespie at al* specifically states at the bottom of column 2 that a melt index much above 4 dg/min is undesirable because it prevents the polyethylene from being extrusion coatable. *Gillespie et al* emphasizes a similar point regarding the swell ratio, noting at the top of column 3 that a swelling ratio much above 1.3 is undesirable because it prevents extrusion coating.

As *Gillespie et al* specifically teaches away from the claimed values, noting that it is disadvantageous to use polyethylene having a swelling ratio greater than 1.3, a melt flow index above 4 dg/min and an annealed density below 0.92 g/cc, it would not have been obvious based on the disclosure in *Gillespie et al* to replace the material described in *Eckstein* with polyethylene having the claimed ranges recited in Claim 1. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1550, 220 U.S.P.Q. 303, 311 (Fed Cir. 1983).

The Examiner responds to these points by twisting the *Gillespie et al* disclosure to suggest something it does not. The Examiner notes the discussion in *Gillespie et al* stating that: 1) polyethylene with an annealed density **much** lower than 0.92 g/cc is undesirable because it tends to exhibit high coefficients of friction; 2) polyethylene having a melt index **much** above 4 is undesirable because it does not permit the polyethylene to be extrusion coatable; and 3) polyethylene with a swell ratio that falls **much** above 1.3 is undesirable because it is not extrusion coatable.

Based on these discussions, the Examiner takes the position that because *Gillespie et al.* emphasizes that the stated values for annealed density, melt flow index and swelling ratio should not be **much** above/below the stated values, it would have been obvious to use values for the annealed density, melt flow index and swell ratio that are outside the specifically disclosed values. The Examiner's reasoning appears to be that even though *Gillespie et al* discloses particular values and explains why values outside those ranges are undesirable, it would have been obvious to select values above/below the disclosed ranges so long as the selected values are not too much above/below the disclosed values. Such an interpretation is not at all consistent with what *Gillespie et al* discloses.

Gillespie et al. is rather specific in pointing out the stated ranges for the melt index, annealed density and swell ratio. The fact that *Gillespie et al.* goes on to describe why the disclosed values for the melt index, annealed density and swell ratio should not be above/below the stated values, and describes drawbacks and difficulties that occur when the values are much above or much below the stated values, is not a teaching directing one to go beyond the ranges specified. Quite the contrary, the description in *Gillespie et al.* discussing problems that arise when values outside the stated ranges are employed is merely an explanation of why the stated ranges are important and were found to provide the results sought to be achieved by *Gillespie et al.* Thus the discussion in *Gillespie et al.* describing difficulties created by using LDPE having a melt index, annealed density and swell ratio outside the stated ranges would not have directed one to depart from the disclosed ranges and arrive at the claimed values set forth in Claim 1.

Because the stated values for the melt flow index, swell ratio and annealed density described in *Gillespie et al.* are not in accord with the values recited in the independent claims, applying the disclosure in *Gillespie et al* to the sheet structure disclosed in *Eckstein* would not have led one to do that which is defined in the independent claims as the invention.

The differences between the values recited in Claim 1 and the values disclosed in *Gillespie et al* are at least in part attributable to the different objectives sought to be achieved. *Gillespie et al* points out at the bottom of column 1 that the objective sought to be achieved is the production of an extrusion coated polyethylene laminate that can be sealed at a low temperature. This is achieved using LDPE having the disclosed values for annealed density, melt index and swell ratio, among others. In contrast, the packaging material at issue here seeks to achieve relatively quick heat-sealing, tougher seal strength and reliable seals over a wider temperature range than previously used packaging materials at least in part through use of an innermost layer containing LLDPE having the claimed characteristics. In addition, the examples and comparative examples discussed in the application beginning at page 19 make clear that packaging material having an innermost layer containing LLDPE with the noted characteristics achieves results not found in packaging material having an innermost layer containing LDPE.

As a final point, the Examiner notes in connection with the claimed average density of 0.900 g/mL – 0.915 g/mL that *Gillespie et al* mentions an annealed density of less than 0.92 g/ml in lines 53-63 of column one. The Examiner appears to take the position that this reference in *Gillespie et al* to an annealed density of less than 0.92 g/ml supports the position that it would have been obvious to utilize an

annealed density outside the disclosed range. However, this reference to low density polyethylene (LDPE) having an annealed density below 0.92 g/cc is set forth in the background portion of *Gillespie et al.* Here, *Gillespie et al.* merely notes that such low density polyethylene can be heat sealed when formed as an extrusion coated polyethylene laminate at temperatures below 95°C. However, *Gillespie et al.* does not state that the low density polyethylene LDPE which is the subject of the patent should also have such characteristics. Indeed, just the opposite is true. The fact that *Gillespie et al.* recognizes low density polyethylene having an annealed density below 0.92 g/cc, yet specifically discloses that the polyethylene which is the subject of the patent should have an annealed density of 0.92 g/cc to 0/93 g/cc is a clear indication that *Gillespie et al.* does not envision using a low density polyethylene having an annealed density below 0.92 g/cc. *Gillespie et al.* clearly recognized the availability of low density polyethylene having an annealed less than 0.92 g/cc, yet chose not to use such a low density polyethylene, presumably because a low density polyethylene having an annealed density below 0.92 g/cc would not provide the objectives sought to be achieved by *Gillespie et al.* Thus, the reference to an annealed density below 0.92 g/cc in the background portion of Gillespie et al. does not support the Examiner's position, and in fact contradicts it.

For at least the reasons discussed above, it thus respectfully submitted that combining the disclosures in *Eckstein* and *Gillespie et al* would not have led one to do that which is recited in Claim 1 as the invention.

2. Dependent Claim 2

Dependent Claim 2 further defines the packaging material recited in independent Claim 1 by reciting that the thermoplastic material outermost layer contains at least a linear low density polyethylene having an average density of 0.900 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer. The outermost layer 12 in the sheet structure disclosed in *Eckstein* is described as an LDPE layer, although *Eckstein* later notes near the top of column 6 that the outer layer 12 may be made of a material compatible with the inner layer 32 for heat sealing purposes. *Eckstein* goes on to note that examples of acceptable materials include LLDPE. However, *Eckstein* once again lacks any disclosure of utilizing a linear low density polyethylene having the claimed values for average density, peak melting point, melt flow index and swelling ratio.

To address these deficiencies, the Examiner once again relies upon the disclosure in *Gillespie et al*. For reasons similar those discussed above in connection with Claim 1, it is submitted that the combined disclosures contained in *Eckstein* and *Gillespie et al* would not have directed one to do that which is recited in Claim 2. As discussed previously, *Gillespie et al* does not disclose a **linear low density polyethylene** (LLDPE) having the disclosed values, but rather specifically envisions a **low density polyethylene** (LDPE). Further, *Gillespie et al* does not disclose values for melt flow index and swelling ratio that are the same as recited in Claim 2. In fact, as explained above, *Gillespie et al* actually teaches away from the values recited in Claim 2. It is thus respectfully submitted that the combined

disclosures in *Eckstein* and *Gillespie et al* would not have led one to produce a packaging material having the additional features recited in Claim 2.

3. Dependent Claim 3

Dependent Claim 3 recites an adhesive layer between the barrier layer and the innermost layer, and defines that the adhesive layer contains at least linear low density polyethylene (LLDPE) having an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 2-15 micrometer.

Eckstein discloses that the multi-layer sheet structure includes a layer 30 of EAA that adheres the innermost layer 32 to a foil layer 28. However, nowhere does *Eckstein* state that the adhesive layer 30 contains at least a linear low density polyethylene (LLDPE) having the claimed values for average density, peak melting point, melt flow index and swelling ratio.

Further, as discussed above, *Gillespie et al* discloses the use of low density polyethylene (LDPE) having certain values for melt index, annealed density and swell ratio. However, nowhere does *Gillespie et al* disclose or suggest that an adhesive layer between a barrier layer and an innermost layer in a multi-layer packaging material should contain a linear low density polyethylene (LLDPE) having the claimed values for average density, peak melting point, melt flow index and swelling ratio. More specifically, nothing in *Gillespie et al* suggests replacing the EAA adhesive layer disclosed in *Eckstein* with an adhesive layer containing LLDPE and having the claimed values. *Gillespie et al* does not appear to be particularly concerned with the composition and characteristics of adhesive layers such as the

adhesive layer between a barrier layer and an innermost layer in a multi-layer packaging material. Thus, a combination of the disclosures contained in *Eckstein* and *Gillespie et al.* would not have led one to utilize an adhesive layer between a barrier and an innermost layer that contains a linear low density polyethylene having the claimed characteristics.

4. Dependent Claim 4

Dependent Claim 4 further defines that the packaging material includes an adhesive thermoplastic material layer between the paper substrate layer and the barrier layer. The claim goes on to recite that the adhesive thermoplastic material layer contains at least a linear low density polyethylene having an average density of 0.890 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 10 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer.

The multi-layer sheet structure disclosed in *Eckstein* includes a paper layer 16 as well as a foil layer 28. In addition, several adhesive layers 18, 26 are between the paper layer 16 and the foil layer 28. However, *Eckstein* does not disclose that the adhesive layers 18, 26 contain at least a linear low density polyethylene (LLDPE) having the claimed values for average density, peak melting point, melt flow index and swelling ratio.

Gillespie et al is similarly deficient. *As noted, Gillespie et al* describes the use of low density polyethylene (LDPE) having certain values for melt index, annealed density and swell ratio for purposes of permitting low temperature sealing. However, *Gillespie et al* does not disclose or suggest that adhesive layers such as

those described in *Eckstein* should be made to contain a linear low density polyethylene (LLDPE) having the claimed values for average density, peak melting point, melt flow index and swelling ratio. Once again, *Gillespie et al* does not appear to be particularly concerned with the composition and characteristics of adhesive layers used in a multi-layer packaging material. Thus, it can hardly be said that *Gillespie et al* teaches replacing the adhesive layers 18, 26 described in *Eckstein* with adhesive layers containing a linear low density polyethylene (LLDPE) having the claimed values for average density, peak melting point, melt flow index and swelling ratio recited in Claim 4.

Thus, a combination of the disclosures contained in *Eckstein* and *Gillespie et al* would not have resulted in a packaging material having the additional features and characteristics recited in Claim 4.

5. Independent Claim 6

Claim 6 recites a paper packaging container formed from a packaging material comprising at least an outside thermoplastic material layer, a paper substrate layer and an inside thermoplastic material layer. The inside thermoplastic material layer contains at least a linear low density polyethylene having an average density of 0.910 g/ml - 0.930 g/ml, a peak melting point of 115°C or more by differential scanning calorimetry, a melt flow index of 5 dg/min - 15 dg/min, and a swelling ratio of 1.45 -1.55.

As discussed above, *Eckstein* mentions that the LDPE layer 32 can be composed of LLDPE rather than LDPE. However, *Eckstein* does not disclose that

the layer 32 should possess the average density, a peak melting point, melt flow index, and swelling ratio values recited in Claim 6.

In addition, for reasons similar to those set forth above in connection with the discussion of Claim 1, the disclosure *Gillespie et al* would not have directed one to modify the sheet structure disclosed in *Eckstein* to result in a packaging material having such values. *Gillespie et al* does not disclose a **linear low density polyethylene** (LLDPE) having the disclosed values for annealed density, melt index and swell ratio. Instead, *Gillespie et al* discloses those values specifically in the context of a **low density polyethylene** (LDPE). Further, *Gillespie et al* does not disclose values for melt flow index and swelling ratio that are the same as recited in Claim 6. In fact, as explained previously, the disclosure in *Gillespie et al* actually teaches away from the values recited in Claim 6. That is, *Gillespie at al* emphasizes that a melt index much above 4 dg/min is undesirable because it prevents the polyethylene from being extrusion coatable and also states that a swelling ratio much above 1.3 is undesirable. One skilled in the art studying the disclosure in *Gillespie at al* would not have been led to employ LLDPE having values for swelling ratio and melt flow index as set forth in Claim 6 because such would be contrary to what *Gillespie at al* describes.

The Examiner argues that even though *Gillespie et al* does not describe many of the claimed values for melt flow index and swelling ratio, such values could have been readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product. That is not the case here though. *Eckstein* discloses a method of extrusion coating polyethylene, and *Gillespie et al* discloses a method of joining two extrusion coated polyethylene

laminate surfaces. Both methods involve extruding polyethylene. *Gillespie et al* specifically states that it is undesirable to extrude polyethylene having the claimed values of density, melt flow index, and swell ratio. Thus, one seeking to "optimize" these values as suggested by the Examiner would not have been directed to do that which is defined in Claim 6 because such "optimization" would have been directly contrary to what *Gillespie et al* describes.

It is thus respectfully submitted that the combined disclosures in *Eckstein* and *Gillespie et al* would not have led one to produce a packaging material having the additional features recited in Claim 6.

B. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,418,841 to *Eckstein* in view of U.S. Patent No. 5,536,542 to *Gillespie et al*, and further in view of U.S. Patent No. 5,732,825 to *Ikenoya et al*.

1. Independent Claim 5

Independent Claim 5 recites a paper packaging container having at least a thermoplastic material outermost layer, a paper substrate layer, a barrier layer and a thermoplastic material innermost layer. Claim 5 defines that the thermoplastic material innermost layer contains linear low density polyethylene having the same values for average density, melt flow index and swelling ratio set forth in Claim 1. Thus, all of the arguments set forth above in connection with Claim 1 are equally applicable here and are incorporated by reference.

In addition, Claim 5 recites that the container comprises a strip tape covering a discontinuous section of the thermoplastic material innermost layer between two edges of the packaging material in a liquid tight manner. The claim also defines that the strip tape has a sealing surface layer comprising a linear low density polyethylene having an average density of 0.900 g/ml - 0.915 g/ml, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, and a swelling ratio of at least 1.4 -1.6.

The Examiner admits that neither *Eckstein* nor *Gillespie et al* discloses a strip tape as claimed. The Examiner thus relies on the disclosure in *Ikenoya et al.* This document discloses a packaging container that includes a strip tape 25. The strip tape 25 adheres to the inner surface of the packaging container along a longitudinal sealing portion. The strip tape 25 prevents entry of air into the packaging container from a side edge of the packing material. The strip tape 25 also prevents liquid food from permeating thru the paper substrate 13.

One difference between the subject matter recited in Claim 5 and the disclosure in *Ikenoya et al* is that the sealing surface layer of the strip tape 25 described in *Ikenoya et al* does not comprise a linear low density polyethylene having an average density of 0.900 g/ml - 0.915 g/ml, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, and a swelling ratio of at least 1.4 -1.6. Rather, *Ikenoya et al* discloses that the strip-tape is made of a layer of a modified polyester, an adhesive layer, a layer of a stretched polyester, an adhesive layer, and a layer of modified polyester.

Neither *Eckstein* nor *Gillespie et al* discloses that the leading-surface layer of a strip tape which covers a discontinuous section of a thermoplastic material

innermost layer between edges of the packaging material should comprise a linear low density polyethylene (LLDPE). Indeed, the disclosures in *Eckstein* and *Gillespie et al* are not at all concerned with the construction of a strip tape. The disclosure in *Gillespie et al* of using low density polyethylene (LDPE) for purposes of permitting low temperature sealing is not a teaching that would direct one to utilize a similar material in connection with the leading surface layer of a strip tape. Further yet, even if some motivation did exist for applying the disclosure in *Gillespie et al* to the strip tape described in *Ikenoya et al*, *Gillespie et al* still does not disclose a linear low density polyethylene (LLDPE), let alone a linear low density polyethylene (LLDPE) having the values for average density, melt flow index and swelling ratio as recited in Claim 5.

Although never specifically discussed in any Official Action, the apparent modification proposed by the Examiner involves first applying the strip tape described in *Ikenoya et al* to the package disclosed in *Eckstein*, making the leading surface layer of the strip tape from LLDPE as mentioned in *Eckstein,* utilizing the values for average density, peak melting point, melt flow index and swelling ratio described in *Gillespie et al* (while ignoring the disclosure in *Gillespie et al* describing that such values are associated with the use of LDPE), and then modifying the values for average density, melt flow index and swelling ratio so as to result in the claimed subject matter set forth in Claim 5. There is little to support the position that one skilled in the art would have been motivated to carry out such a convoluted modification and arrive at the claimed invention at issue here.

It is respectfully submitted that Claim 5 is patentable over *Eckstein* in view of *Gillespie et al* and *Ikenoya et al*.

VIII. Conclusion

For the reasons discussed above, appellant respectfully submit that the Examiner's decision finally rejecting Claims 1-6 should be reversed and such action is earnestly solicited.

Respectfully submitted,

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Date: September 16, 2004

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CLAIMS APPENDIX

The Appealed Claims

1. (Previously Presented) A packaging material for making paper containers having an interior comprising at least a thermoplastic material outermost layer, a paper substrate layer, a barrier layer, and a thermoplastic material innermost layer in such order, the innermost layer being adapted to be located closer to the interior of the paper container than the outermost layer when the packaging material is formed into the paper container,

the thermoplastic material innermost layer containing at least a linear low density polyethylene which has a molecular weight distribution and has an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103 °C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-50-micrometer.

2. (Previously Presented) A packaging material for paper containers according to Claim 1, wherein the thermoplastic material outermost layer contains at least a linear low density polyethylene which has a molecular weight distribution, and has an average density of 0.900 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer.

3. (Previously Presented) A packaging material for paper containers according to Claim 1, including an adhesives layer between the barrier layer and the thermoplastic material innermost layer that contains at least a linear low density

polyethylene which has a molecular weight distribution, and has an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 2-15 micrometer.

4. (Previously Presented) A packaging material for paper containers according to Claim 1, including an adhesive thermoplastic material layer between the paper substrate layer and the barrier layer which contains at least a linear low density polyethylene which has a molecular weight distribution, and has an average density of 0.890 g/mL - 0.925 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 10 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 10-25 micrometer.

5. (Previously Presented) A paper packaging container formed from a packaging material comprising at least a thermoplastic material outermost layer, a paper substrate layer, a barrier layer, and a thermoplastic material innermost layer in such order, the innermost layer being located closer to an interior of the packaging container than the outermost layer, the thermoplastic material innermost layer containing at least a linear low density polyethylene which has a molecular weight distribution and has an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-50 micrometer;

a strip tape covering a discontinuous section of the thermoplastic material innermost layer between two edges of the packaging material in a liquid tight manner, and

at least a sealing-surface layer of the strip tape containing a linear low density polyethylene which has a molecular weight distribution and has an average density of 0.900 g/mL - 0.915 g/mL, a peak melting point of 88°C to 103°C, a melt flow index of 5 dg/min - 20 dg/min, a swelling ratio of 1.4-1.6, and a layer thickness of 20-100 micrometer.

6. (Previously Presented) A paper packaging container formed from a packaging material comprising at least an outside thermoplastic material layer, a paper substrate layer, and an inside thermoplastic material layer, in such order, the inside thermoplastic material layer containing at least a linear low density polyethylene, and having an average density of 0.910 g/mL - 0.930 g/mL, a peak melting point of 115 degrees°C or more by differential scanning calorimetry, a melt flow index of 5 dg/min - 15 dg/min, and a swelling ratio of 1.45-1.55.

EVIDENCE APPENDIX

None

RELATED PROEEDINGS APPENDIX

None